CHAPTER 4 CONSTRUCTION PLANS

4.1 PLAN SUBMISSIONS

General criteria for a plan submission are summarized as follows:

- Plans must comply with DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access*. Construction plans must be signed and sealed by a land surveyor or professional engineer registered in Delaware. It is the engineer's responsibility to meet the standards and plan requirements. Plan approval does not release the developer's responsibility to meet the standards. If pavement, geotechnical and/or structural design are included, then a professional engineer registered in Delaware and qualified to perform the design must sign and seal the plans. Exceptions may be permitted at the sole discretion of DelDOT where the proposed development has an average daily traffic generation of less than 100 trips, each vehicle being counted twice (in and out).
- The construction stage fee must be paid prior to review of the semi-final plans as outlined in Chapter 1. If the requirements outlined in these *Standards and Regulations for Subdivision Streets and State Highway Access* are not met by the second semi-final plan submission, then a new application and construction stage fee shall be required prior to further reviews.
- The applicant is required to pay National Pollution Discharge Elimination System (NPDES) fees, as outlined in Chapter 1, when DelDOT reviews a stormwater management facility as part of an offsite improvement project where DelDOT has the review and approval authority for the facility. This payment shall be submitted with the preliminary plans.
- The maximum plan sheet size shall be 24" x 36". Larger plan sheets shall be returned without review.
- Drafting work shall be neat, legible and reflect locations of existing and proposed features based on actual field surveys. All text height shall be 0.1 times the scale of the plan sheet. All text shall be legible when plans are produced at half size.
- Entrance geometry and construction details shall be drawn to a scale of 1" = 30' or 1" = 20', with the former being preferable. Where the proposed development has an average daily traffic generation of less than 100 trips, a scale of 1" = 50' may be permitted.

4.1.1 PRELIMINARY PLANS

Preliminary construction plans shall be prepared showing the feasibility of constructing a subdivision street system or commercial entrance prior to recording the right-of-way with the land use agency. This plan shall be drawn to a scale of no less than 1" = 100'. The plan shall provide, at a minimum, the following information:

- Location map showing the relationship of the site to existing State-maintained roadways.

The location map shall be drawn to a scale of no less than 1 inch = 1 mile.

- Topography of the site shall extend beyond the limits of the property to include the proposed positive drainage outfall, critical features of the existing highway for a minimum distance of 500 feet beyond the proposed entrance location, and such other features as may be necessary in order to determine the feasibility of the project.
- Contours showing the common elevation of the existing ground within the limits of the topographic survey. The contour interval for various ground slopes shall be as follows:

Figure 4.1 Contour Interval for Various Ground Slopes

Average Ground Slope	Contour Interval
Less than 0.5%	1.0 feet with spot grades
0.5% to 5.0%	1.0 feet
Over 5%	2.0 feet

- Lot layout within the site showing relationship of lots to the proposed internal street system.
- Centerline stationing for the internal street system showing the proposed horizontal and vertical alignments.
- Schematic drainage system with supporting preliminary drainage calculations to show the feasibility of the design, including retention areas and outfall.
- If turning lanes and bypass lanes are required to be constructed on the existing highway to serve the site, they must be shown to ensure feasibility of the design.

To facilitate review of the plans, the entrance shall be staked in the field and the drainage outfalls shall be located in order to determine the feasibility of the design.

The applicant shall stake the preferred entrance location based on the following procedures:

- Place two wooden stakes at the entrance. The stakes shall be visible 24 inches to 36 inches above the ground. The stakes shall be placed 24 feet apart, and as close to the roadside property line as possible, while being clearly visible from the road. The stakes shall not be set closer than five feet from the edge of pavement.
- Tie ribbons or apply yellow paint to the top of stakes to make them clearly visible.
- Write the property owner's last name on each stake.

4.1.2 SEMI-FINAL PLANS

Semi-final construction plans shall be reviewed by DelDOT following the "No Objection" letter issued to the land use agency. The plans are to be prepared in accordance with DelDOT requirements. Four complete sets of semi-final construction plans shall be required for the review.

One copy of back-up calculations for design elements outlined in Chapter 5 (i.e., entrance design, sight distance triangles, typical section elements, pavement design, drainage design, and signing and striping) and a complete set of stormwater and sediment/erosion control drawings must be submitted for review with the semi-final plans.

4.1.3 FINAL PLANS

The final construction plans and special provisions must include all revisions required by DelDOT. Final plans must be signed and sealed by a land surveyor or professional engineer registered in Delaware.

For subdivision street construction plan approval, two Mylar sets of the final plans shall be submitted.

For commercial entrance and subdivision entrance construction plan approval in which the

subdivision is located within a town or city limits, six paper sets of final plans shall be submitted.

If the developer intends to phase the construction of a fully reviewed subdivision, then two copies of the signed and sealed title sheet, listing the streets to be constructed in a particular phase, shall be submitted along with an application and security that reflects the streets listed on the title sheet. Subsequent phases will be approved in the same manner. Any phased plan will have to meet the current standards and regulations at the time of approval.

4.2 ELECTRONIC PLAN SUBMISSION

DelDOT's roadway inventory management system tracks information relative to all State-maintained roadways including their location, width, length, drainage features, and signing.

In an effort to keep the system updated, DelDOT requires the following information to be provided to the Development Coordination office prior to acceptance of any subdivision street.

1. **Prior to Construction Plan Approval –**

   Along with the Mylar construction plans, the developer shall submit an electronic file containing the plan sheets. These plans may be submitted in AutoCAD or Microstation format. In order to minimize the required data storage space, DelDOT requires only the construction plan sheet files for projects (e.g., .dwg files). All files shall be purged prior to submittal.

   The developer's engineer shall provide DelDOT with a street map in electronic format. The map, which shall be used for the acceptance drawing, shall include the following information:

   - The property boundaries.
   - Proposed street right-of-way (width-dimensioned).
   - Existing State-maintained roads.
   - A distance (actual field measurement) from each site entrance to the nearest intersection.
   - A minimum of two GPS points as points of reference (Concrete monuments shall be placed at the GPS points).

2. **Prior to Street Acceptance –**

   The developer's engineer shall provide DelDOT with an acceptance drawing in an electronic format. As part of the requirement for electronic plan submission, the drawing shall delineate the portion of subdivision streets proposed for acceptance.

3. **Prior to Street Acceptance of the Final Phase of Construction –**

   The developer's engineer is required to submit the approved as-built construction plan, annotated in red to show all revisions necessitated by field conditions, to the District Engineer or designee prior to the recommendation for acceptance. In addition, the engineer shall also submit an electronic plan version of the as-built construction plan for the entire subdivision to the Development Coordination office. This as-built plan shall replace the original construction plan in the State's electronic inventory.

4.3 SUBDIVISION CONSTRUCTION PLAN CHECKLIST

Any plan submitted to DelDOT for review must contain all elements listed in this section. When a plan is submitted for review, it will be checked to ensure the required elements are on the plan. If any elements are not relevant to the particular site then these elements shall be outlined in the submittal letter. If all elements are not on the plan, the plan will be returned to the engineer for resubmission with no comments provided by DelDOT.

Semi-final and final construction plans shall be prepared in accordance with the following subsections.

4.3.1 TITLE SHEET

A title sheet shall include the following (see Figure 4.5 for a sample title sheet):

1. Name of subdivision.
2. Section of the subdivision or name of the streets to be considered by this plan.
3. Identification of subdivision streets as public or private (see Section 3.6.2).
4. General location map.
5. County in which subdivision is located.
6. Total sheets in subdivision street construction plan.
7. Plan view of entire subdivision indicating streets to be constructed by this plan and their relation to all other streets within the subdivision. Show north arrow for reference.
8. General Notes (see Appendix J).
9. Index of sheets.
10. Legend of utilities.
11. Signature block.
    a. Seal of individual properly licensed in Delaware to perform the engineering and design for the preparation of construction plans for subdivision streets.
    b. Signature of engineer and date.
    c. Signature block and date for Subdivision Engineer approval. Approval applies only to the section of the subdivision being bonded.

4.3.2 TYPICAL SECTION SHEETS

Typical section sheets are required as part of subdivision construction plans. They are required for each major change of section and shall include the following:

1. Typical Street Sections.
    a. Width of street, shoulders and right-of-way.
    b. Cross-slope of pavement, shoulders and side slopes.
    c. Point-of-Profile Grade Application.
    d. Type of curb.
    e. Depth and type of pavement material.
    f. Locations to place topsoil, seed and mulch.
    g. Underdrain.
    h. Subgrade to be prepared in accordance with DelDOT *Standard Specifications*.
    i. Existing and proposed right-of-way widths and easements.
2. Typical Lateral Ditches and/or Outfall Ditches.
    a. Width of ditch bottom.
    b. Point-of-Profile Grade Application (Ditches longer than 100 feet require a profile).
    c. Side slopes.
    d. Type and depth of ditch protection.
    e. Locations to place topsoil, seed, and mulch.

4.3.3 DETAIL SHEETS

Detail sheets shall provide information to the contractor on construction that is not included in the *Standard Construction Details*, and shall include the following:

1. Special Details.
    a. Intersection roads.
    b. Super-elevation diagrams (when required).
    c. Details of non-standard drainage structures.
    d. Driveway details.
2. Intersection Details.
    a. Intersection radii with station and offsets to curve points.
    b. Location by station and offset to islands.

c. Grade elevations at maximum interval of 25 feet on edge of islands and intersection radii.

4.3.4 PLAN SHEET

Plan sheets shall include the following:

1. Horizontal and vertical control data.
   a. Benchmarks: Maximum spacing is 1000 feet. Show elevation and location.
   b. Centerline stationing and curve data.
   c. Survey references to horizontal control points.
   d. Bearings of centerline tangents.
   e. Stations of intersecting roads.
   f. Limits of construction.
   g. North arrow on each plan sheet.
   h. Right-of-way line (dimensioned from centerline of road).

2. Utilities.
   a. Location of existing and proposed utility lines including sewer, water, power, communication, and cable. A separate set of utility plan sheets may be required depending on the complexity of the plan sheet.

3. Drainage.
   a. Location and elevations of parallel ditches every 50 feet.
   b. Location and type of ditch protection other than seed and mulch.
   c. Drainage flow arrows on pipes and ditches.
   d. Identify and locate drainage structures, storm sewers, and culverts with specific identifiers.
   e. Location, flow line, elevation, typical section and ditch protection for culvert or storm sewer outfall.
   f. A pipe and drainage structure schedule shall be included on each plan sheet. These schedules shall list the structure ID, type, invert, and top elevation, pipe ID, size, length, invert elevations, slopes and type. See Figures 4.3 and 4.4 for storm drainage structure and pipe schedule.
   g. Pipe angles shall be listed in the schedule and shall not exceed the maximum values listed in Figures 5-30 thru 5-32.

4. Minimum scale for construction plans is 1" = 50'. Intersection details shall be at 1" = 30'.

4.3.5 PROFILE SHEET

Profile sheets shall be on same sheet as plan sheets, where possible. Profile sheets shall include the following:

1. Horizontal scale – Horizontal scale shall be same as plan sheet.
2. Vertical scale – Vertical scale shall generally be 1" = 5'.
3. Vertical Curve Data: PVC, PVI, PVT, length of curve, PVI Elevation.
4. Soil information (when available) – Use exaggerated scale and indicate type and depth of material.
5. Drainage features – Identify drainage features with pipe or structure identifier that matches schedule.
6. Existing and proposed utilities.

4.3.6 MAINTENANCE OF TRAFFIC

To ensure that traffic control for construction along State-maintained roadways has been addressed on all land development projects, a Maintenance of Traffic (MOT) plan must be submitted and approved prior to final construction plan approval by the Subdivision Engineer. All MOT plans shall be developed in accordance with the "Traffic Controls for Streets and Highway Construction, Maintenance, and Utility Operations" hereafter referred to as DelDOT's Traffic Control Manual and shall be submitted to the Subdivision Engineer with the construction plans. The MOT plans shall be reviewed and approved by the District Safety Officer as part of DelDOT's internal review process.

A MOT plan must be prepared for all projects. Depending on the complexity of the project, the plan may range from a short narrative including the MOT case diagram and its associated case notes in the DelDOT Traffic Control Manual on the plans to a series of sheets detailing the traffic control measures for phased construction as directed by DelDOT. See Appendix J for General Notes for MOT.

A copy of the MOT plan approval letter shall be required to be on the construction site at all times.

4.3.7 ENTRANCE PLAN

Entrance plans shall include the following:

a. Property lines.
b. Existing and proposed right-of-way.
c. Existing and proposed easements.
d. Names of abutting land owners.
e. Planimetric features.
f. Existing grade contours.
g. Proposed finished grade contours.
h. Location of any crossovers.
i. Roadway curves.
j. Existing and proposed entrances serving the adjacent properties.
k. Proposed sight distance easements.
l. Existing drainage features.
m. Location of existing and proposed buildings.
n. Parking layout.
o. Proposed site drainage.
p. Proposed entrance geometry.
q. Entrance construction details.
r. Typical sections showing:
    - Width of through lane.
    - Width of proposed shoulder.
    - Width of shoulder widening.
    - Width of right-of-way.
    - Width of deceleration lane.
    - Width of bypass lane.
    - Width of drainage easement (if applicable).
    - Slope of roadside embankment (front slope and back slope).
    - Cross slope of shoulder.
    - Cross slope of deceleration lane.
s. Proposed limit of construction.
t. Existing roadway lane widths and striping.
u. Dimensions for all entrance radii.
v. Existing and proposed utility poles, signs, etc.
w. North arrow.
x. Site generated ADT and distribution (per the latest edition of the ITE Trip Generation).
y. Mainline ADT (existing and projected) and speed limit.
z. Signing and striping plan.

At a proposed entrance that requires widening to the existing State-maintained roadway, spot elevations on the proposed edge of pavement and where the proposed pavement meets the existing pavement shall be provided at 25-foot intervals. Spot elevations at the entrance radii shall be given at ten-foot intervals. Corresponding elevations of the existing ground, at the edge of proposed pavement, shall also be provided to assess the proposed cut and fill depth.

4.3.8 COST ESTIMATE

Following the approval of the final construction plan, a cost estimate for the intended street construction shall be prepared using the cost per linear foot (lf) of roadway being constructed. A separate cost estimate shall be prepared for entrance improvements and shall be provided to DelDOT for review. Each item of construction shall be listed in accordance with DelDOT's *Standard Specifications*. The method of measurement for each item shall be in accordance with the *Standard Specifications* and a current unit price shall be supplied for each item.

The itemized construction cost estimate shall be broken down to provide sufficient detail to allow DelDOT to establish the accuracy and completeness of the estimate. Each material shall

be accounted for as a separate item in the estimate as illustrated below.

DelDOT, as part of the review, shall approve all the costs. These estimates shall be used to determine the security required for each part of construction.

Figure 4.2 Itemized Cost Estimate Example

Item	Quantity	Unit Cost	Total Cost
Concrete Curbing Type 2	15,000 l.f.	$20.00 per l.f.	$300,000.00
Hot-mix, Type B	2,500 tons	$38.00 per ton	$95,000.00

Figure 4.3 Storm Drainage Structure Schedule

Name	Description			T.G. Elev.	Invert In	Invert In	Invert In	Invert Out	Pipe Angle	Pipe Angle
	Box	Top Unit	Grate							

Figure 4.4 Storm Drainage Pipe Schedule

Pipe	Description							Invert Elevation	
	From	To	Size	Type	Length	Class	Slope (%)	In	Out

4.4 COMMERCIAL ENTRANCE PLAN CHECKLIST

Any plan submitted to DelDOT for review must contain all elements listed in this section. When a plan is submitted for review, it will be checked to ensure the required elements are on the plan. If any elements are not relevant to the particular site then these elements shall be outlined in the submittal letter. If all elements are not on the plan, the plan will be returned to the engineer for resubmission with no comments provided by DelDOT.

This section also applies to the requirements for private subdivision entrances onto State-maintained roadways.

4.4.1 TITLE SHEET

Title sheets shall include the following:

1. A title block containing:
   a. Name of proposed business.
   b. Name of nearest town or county.
   c. Maintenance number of roadway being accessed.
   d. Graphic scale (1" = 30' preferred, 1" = 20' acceptable).
   e. Date.
   f. Name, address and telephone number of engineer or surveyor preparing plan.
   g. Seal of engineer or surveyor (Delaware license required).
2. A data block containing:
   a. Type of business.
   b. Gross acreage of property.
   c. Approximate gross leasable floor plan.
   d. Traffic generation (ADT) with trip distribution shown.
   e. Peak hour traffic distribution in terms of vehicles per hour (vph).
   f. Parking spaces required.
   g. Parking spaces furnished.
3. A 1" = 800' key map measuring six square inches, with all crossroads clearly marked.
4. A North arrow.
5. General Notes (see Appendix J).

4.4.2 ENTRANCE PLAN

Entrance plans shall include the following:

a. Property lines.
b. Existing and proposed right-of-way.
c. Existing and proposed easements.
d. Names of abutting land owners.
e. Planimetric features.
f. Existing grade contours.
g. Proposed finished grade contours.
h. Location of any crossovers.
i. Roadway curves.
j. Existing and proposed entrances serving adjacent properties.
k. Proposed sight distance easements.
l. Existing drainage features.
m. Location of existing and proposed buildings.
n. Parking layout.
o. Proposed site drainage.
p. Proposed entrance geometry.
q. Entrance construction details.
r. Typical sections showing:
   - Width of through lane.
   - Width of proposed shoulder.
   - Width of shoulder widening.
   - Width of right-of-way.
   - Width of deceleration lane.
   - Width of bypass lane.
   - Width of drainage easement (if applicable).
   - Slope of roadside embankment (front slope and back slope).
   - Cross slope of shoulder.
   - Cross slope of deceleration lane.
s. Proposed limit of construction.
t. Existing roadway lane widths and striping.

u. Dimensions of all entrance radii.
v. Existing and proposed utility poles, signs, etc.
w. North arrow.
x. Site generated ADT and distribution (per the latest edition of the ITE Trip Generation).
y. Mainline ADT (existing and projected) and speed limit.
z. Signing and striping plan.

At a proposed entrance that requires widening to the existing State-maintained roadway, spot elevations on the proposed edge of pavement and where the proposed pavement meets the existing pavement shall be provided at 25-foot intervals. Spot elevations at the entrance radii shall be given at 10-foot intervals. Corresponding elevations of the existing ground, at the edge of proposed pavement, shall also be provided to assess the proposed cut and fill depth. The proposed spots along a curb line should show top and gutter line of curb.

4.4.3 MAINTENANCE OF TRAFFIC

To ensure that traffic control for construction along State-maintained roadways has been addressed on all land development projects, a Maintenance of Traffic (MOT) Plan must be submitted and approved prior to final construction plan approval by the Subdivision Engineer. All MOT plans shall be developed in accordance with the DelDOT Traffic Control Manual and shall be submitted to the Subdivision Engineer with the construction plans. The MOT plans shall be reviewed and approved by the District Safety Officer as part of DelDOT's internal review process.

MOT plans must be prepared for all projects. Depending on the complexity of the project, the plan may range from a short narrative and with a reference to a case number in the DelDOT Traffic Control Manual to a series of sheets detailing the traffic control measures for a phased construction as directed by DelDOT.

A copy of the MOT approval letter shall be required to be on the construction site at all times.

4.4.4 COST ESTIMATE

Following the approval of the final construction plan, a cost estimate for the entrance improvements shall be prepared and shall be provided to DelDOT for review. Each item of construction shall be listed in accordance with DelDOT's *Standard Specifications*. The method of measurement for each item shall be in accordance with the *Standard Specifications* and a current unit price supplied for each item.

The itemized construction cost estimate shall be broken down to provide sufficient detail to allow DelDOT to establish the accuracy and completeness of the estimate. Each material shall be accounted for as a separate item as illustrated in Figure 4.2.

DelDOT, as part of the review, shall approve all the costs. These estimates shall be used to determine the security required for each part of construction.

4.5 OFF-SITE IMPROVEMENT PLANS

The developer's engineer shall prepare and submit to DelDOT for review and approval all right-of-way plans, construction plans, specifications, and estimates for the project as outlined in the Off-site Improvement Agreement described in Section 3.10.2. All required submissions to internal DelDOT support sections shall be made to the Development Coordination Section and then shall be distributed throughout DelDOT in accordance with these regulations The engineer shall design the project in accordance with the *American Association of State Highway and Transportation Officials* (AASHTO) *A Policy on Geometric Design of Highways and Streets*, DelDOT *Standards Specifications, Policies, and Practice*. The engineer shall notify DelDOT in writing of any

conflicts with AASHTO or DelDOT *Design Standards, Specifications, Policies or Practice*.

In instances where the engineer determines that it is not in the best interest of the project to comply with these standards, the engineer shall provide to DelDOT a written justification and rationale for their decision. DelDOT shall have the final authority on any process modifications or design exceptions.

The plan submissions will consist of a preliminary, semi-final, and final (or contract) plan submission. The engineer shall establish review dates with concurrence from DelDOT. The submittals shall include design plans, specifications and cost estimates for construction of the project.

The engineer shall coordinate with the utility companies to determine existing facility locations and to start the discussions on possible relocations.

Existing deeds, plot plans and existing roadway plans shall be used to establish and verify the existing right-of-way. The engineer is responsible for attesting to the right-of-way shown on the plans.

The engineer will work through the Development Coordination Section and the Pavement Management Section for pavement evaluation and design verification. This may include pavement cores and subgrade soils analysis. The engineer will work with Design Services for hazardous material/contaminated site delineation.

The engineer will work with Design Services on identifying environmental or cultural resources that are present within the existing and/or proposed right-of-way. The engineer shall prepare, apply for, and obtain all necessary permits and environmental or historic documentation required by federal, state, and local authorities. Copies of the permits and supporting documentation shall be provided to DelDOT prior to final plan approval.

DelDOT will provide assistance in identifying but not obtaining all necessary permits and coordination for off site road improvements. The following may be required to construct the off-site improvements:

- Right-of-way.
- Utility coordination.
- 404 – Wetlands.
- 4f – Historical Sites.
- 6f – Parklands.
- NPDES Permit for erosion control.
- Subaqueous Land Permit – for wetland impacts.

4.5.1 PRELIMINARY CONSTRUCTION PLANS

Preliminary construction plans shall include the following:

a. Title sheet.
b. Plan sheet index.
c. Notes and legend sheet.
d. Typical sections.
e. Horizontal and vertical control.
f. Construction plan with proposed design (including conceptual drainage layout and clear zone).
g. Existing and proposed profile including existing drainage.
h. Grades and Geometrics showing where coordinates are to be given (edge of gutter, begin/end of transitions, and critical curve points) for proposed geometrics and tick marks where grades will be given (edge of gutter in intersections, super-elevation transitions, and critical points).
i. Conceptual stormwater management or a waiver from the SWM Engineer.
j. Construction details.
k. Conceptual construction phasing, detailed enough for discussion and brainstorming.
l. Conceptual environmental compliance plan,
m. Lighting plans (including proposed pole locations).

n. Signing and striping and coordination conduit plans with proposed striping and existing signs shown.
o. Signalization plans (including proposed signal pole locations).

The preliminary construction plans shall be reviewed by the following stakeholders. The developer's engineer shall ensure proper coordination with appropriate agencies:

a. To utility companies for overhead facility relocation design (to determine real estate needs), and underground facility conflict review. Based upon extent of underground utility conflicts and coordination with Utilities Section, request appropriate number of utility test pits and designation where necessary through Utilities Section. Also, provide locations and approximate depths of large cuts and fills.
b. To Stormwater Engineer for review and comment.
c. To Traffic for review and comment pertaining to signal design, proposed signing, and striping, and detour plan consideration.
d. To Construction for overall plan review and comment.
e. To Roadside Development Administrator to determine tree replacement requirements and subsequent real estate needs. The engineer shall coordinate tree impact and mitigation analysis with a landscape architect.
f. To Design Services for documentation of proposed impacts to environmental and cultural resources. The engineer should also keep Design Services aware of all correspondence that has occurred between the resource agencies and the developer.

Continued coordination with affected utility companies is required at this stage. Projects that require overhead utility relocation must have the location of relocated facilities soon after the preliminary plan submission. This is required so the proper amount of real estate can be acquired or dedicated to facilitate the relocation, and coordination of these facilities can be coordinated with other aerial items such as signal poles and light poles. It is also imperative that the utility test hole information be analyzed to determine which underground utility conflicts cannot be avoided. Once it is determined that it is not possible to avoid the utility conflict, the affected utility company needs to be informed as soon as possible so underground relocation design can commence. If underground relocation will impact real estate needs, it should be identified at this time. It should also be noted that any conflicts that arise after preliminary plan submittal, as the result of a design change, should be brought to the attention of the affected utility company as soon as it is identified.

For projects with complex maintenance of traffic issues, a coordination meeting should be held with Construction and Traffic (including the Safety Section) to receive their input.

Depending on complexity of project, at least one Design Public Workshop will typically be held soon after the preliminary plan submittal.

The Subdivision Engineer should allow no less than 45-days review time from the date of submittal.

4.5.2 SEMI-FINAL CONSTRUCTION PLANS (95%)

Semi-final construction plans (95%) shall include the following:

a. Title sheet.
b. Plan sheet index.
c. Notes and legend sheet.
d. Typical sections.
e. Horizontal and vertical control.
f. Construction plan with final proposed design (including final drainage with pipe sizes and inverts).
g. Existing and proposed profile including existing and proposed drainage, underground utilities with test hole data, soil boring, and test holes plotted.

h. Grades and geometrics with final geometrics and grades.
i. Semi-final stormwater management plans and report or a waiver from the SWM Engineer.
j. Construction details.
k. Construction phasing, M.O.T., and erosion control plans (with semi-final utility construction phasing taken into account).
l. Detour plans.
m. Final Environmental Compliance Plan.
n. Lighting plan.
o. Landscaping plan.
p. Utility relocation plans (overhead utility relocations required; with underground facility relocation design when possible. Where underground facility relocation impacts real estate needs, horizontal location is required).
q. Signing and striping and coordination conduit plans with final striping and proposed signs and sign locations shown (including final sign structure locations).
r. Signalization plans.
s. Semi-final cross sections (existing surface, proposed surface, LOC, existing and proposed right-of-way, clear zones).

The developer's engineer shall ensure proper coordination with appropriate agencies: The semi-final construction plans shall be reviewed by the following stakeholders:

a. To Stormwater Engineer with Semi-final Stormwater Report for review and comment.
b. To Construction with marked up Semi-final special provisions for review and comment.
c. To Traffic for review and comment.
d. To Specifications Engineer for review and comment.
e. To Roadside Development Administrator to ensure proper selection of tree types for replacement policy.
f. To Design Services for documentation of proposed impacts to environmental and cultural resources. Any permits that have been issued shall be made available to the Design Services Section.
g. Other submittals are to be made to the following for general review and comment: Materials and Research, Quality Section, Chief Safety Inspector, Bicycle/Pedestrian Coordinator, Architectural Accessibility Board (for approval), DTC, Chief Engineer and others as determined by the Subdivision Engineer.
h. To utility companies for final utility relocation design. Coordination will occur with the Quality Section to determine the construction time necessary for the project taking into account the time detailed in the final utility statements. The construction sequencing bar charts will be updated and ultimately included in the final advertisement package.

The Subdivision Engineer should allow no less than 45-days review time from the date of submittal.

4.5.2.1 Semi-Final Right-of-Way Plans

Semi-Final Right-of-Way plans shall be developed in accordance with the DelDOT standards. These plans will be submitted for review to Design Support. The Design Support Section shall review these plans from a technical perspective as well as attesting to the need based on the design parameters established during the initial project scoping.

- The following section lists the requirements for semi-final right-of-way plans. Title sheet
- Symbol sheet
- Geometric sheet
- Mosaic
- Right-of-way plans
- Right-of-way data sheets
- Right-of-way tabulation sheets

See Appendix D for the right-of-way plan checklist.

4.5.3 FINAL CONSTRUCTION PLANS (100%)

Final construction plans (100%) shall include the following:

a. Title sheet (signed & sealed).
b. Plan sheet index.
c. Notes and legend sheet.
d. Typical sections.
e. Horizontal and vertical control.
f. Final construction plan.
g. Existing and proposed profile including existing and proposed drainage, underground utilities, soil boring, and test holes plotted.
h. Grades and Geometrics with final geometrics and grades.
i. Final stormwater management plans and report.
j. Construction details.
k. Construction phasing, M.O.T., & erosion control plans (with utility construction phasing included).
l. Detour plans.
m. Lighting plan.
n. Landscaping plan.
o. Utility relocation plan.
p. Final signing and striping and coordination plans.
q. Signalization plans.
r. Final cross sections (existing surface, proposed surface & box, LOC, existing & proposed right-of-way, clear zone, existing & proposed drainage, relocated and proposed utilities).

The developer's engineer shall also submit final construction plans to the following and make proper coordination with appropriate agencies:

a. To Stormwater Engineer with final Stormwater Report.
b. Construction
c. Utilities
d. Traffic

The Subdivision Engineer should allow no less than 45-days review time from the date of submittal.

4.5.3.1 Final Right-of-Way Plans

Final right-of-way plans shall include the following:

- Title Sheet (signed & sealed).
- Symbol sheet.
- Geometric sheet mosaic.
- Right-of-way plans.
- Right-of-way data sheets.
- Right-of-way tabulation sheets.
- Semi-final cross sections (existing surface, proposed surface, LOC, existing & proposed right-of-way).

See Appendix D for the right-of-way plan checklist.

The right-of-way plans will remain in the semi-final status until all comments from the Design Support Section have been addressed. Once the final right-of-way plans meet all the established criteria they shall be approved as to process by the Subdivision Engineer, the Manager of the Design Support Section and the Assistant Director-Design.

4.5.4 COST ESTIMATE

Following the approval of the final construction plan, a cost estimate for the roadway improvements shall be prepared and shall be provided to DelDOT for review. Each item of construction shall be listed in accordance with DelDOT's *Standard Specifications*. The method of measurement for each item shall be in accordance with the *Standard Specifications* and a current unit price supplied for each item.

The itemized construction cost estimate shall be broken down to provide sufficient detail to

allow DelDOT to establish the accuracy and completeness of the estimate. Each material shall be accounted for as a separate item as illustrated in Figure 4.2.

DelDOT, as part of the review, shall approve all the costs. These estimates shall be used to determine the security required for each part of construction.

4.6 INDUSTRIAL PARK STREETS

Industrial park streets shall follow the standard construction plan development procedure, as previously outlined in Section 4.3.

4.7 STANDARDS AND SPECIFICATIONS

4.7.1 STANDARDS

DelDOT has developed *Standard Construction Details* to provide consistency on State-maintained projects. *Standard Construction Details* may be purchased from DelDOT and are also available on DelDOT's website (www.DelDOT.gov).

The *Standard Construction Details* shall be utilized in the construction unless there is some unusual circumstance requiring a special design. The plans shall show construction details only for those construction elements not shown in the *Standard Construction Details*.

If there are engineering elements including but not limited to, structural designs required on a plan that are not included in the *Standard Construction Details* then detailed engineering shop drawings signed and sealed by a professional engineer shall be submitted to DelDOT for review and approval. All structural elements shall be designed in accordance with AASHTO LRFD *Bridge Design Manual* (latest revised edition). DelDOT's Bridge Section will have the review and approval authority.

The project shall be constructed using the latest revised *Standard Construction Details* in effect at the date of Notice to Proceed.

4.7.2 SPECIFICATIONS

Specifications for frequently used construction items have been prepared by DelDOT. Copies of these *Standard Specifications* may be purchased from DelDOT (www.DelDOT.gov).

The construction of subdivision streets shall be in accordance with the current DelDOT *Standard Specifications*. Should it be necessary to construct an item for which a standard does not exist or where it is desired to modify the *Standard Specifications*, special provisions shall be developed to provide the contractor the necessary information to construct the item. These special provisions as well as any other relevant information shall be bound and submitted with the final construction plans for review and approval.

The project shall be constructed using the latest revised *Standard Specifications* in effect at the date of Notice to Proceed, and the special provisions, as approved by DelDOT.

4.7.3 SPECIAL PROVISIONS

Special provisions shall be a bound document included as part of the final plan submission. This document shall include direction to the contractor on items that are not found in the *Standard Specifications*. These items may include, but not limited to, easements, environmental permits, special record plan notes, and TIS recommendations agreements. This document may also include additional information, as requested by DelDOT, to assist in the implementation of the construction.

4.8 STORMWATER MANAGEMENT

DelDOT will work cooperatively with regulating agencies responsible for enforcing Delaware Sediment and Stormwater Regulations

(DSSR) to ensure stormwater is adequately controlled. These agencies include Delaware Department of Natural Resources and Environmental Control (DNREC), New Castle County Land Use Engineering, New Castle County Conservation District, Kent Conservation District (KCD), and Sussex Conservation District (SCD).

Stormwater management shall meet State regulations in terms of quality and quantity as outlined in the Erosion and Sediment Control Stormwater Management (ES_2M) Design Guide.

Stormwater management shall be designed for all existing and proposed roadway work and total project runoff including roadway runoff shall be managed by a private stormwater management facility.

When determining the need for stormwater management, the impervious areas added to the existing State-maintained roadway shall be considered. If stormwater management is required it shall be managed by a private stormwater management facility. The area of the entrance construction shall be included in the analysis and clearly documented in the stormwater report.

When the proposed development is limited to the site and the entrance, the review of design and construction of stormwater management facility is performed by a non-DelDOT delegated agency for DSSR enforcement. In this case, the non-DelDOT delegated agency shall attest that the DSSR within DelDOT right-of-way have been met and shall be documented in a memo and forwarded to DelDOT's Stormwater Engineer for files.

If the proposed roadway work is not contiguous with the land development proposal, the review of design and construction of stormwater management facility shall be performed by DelDOT's ES_2M for DSSR enforcement. The Stormwater Engineer will sign the plans upon determination of full compliance of the plans and reports with the requirements of DSSR indicating that the plans meet the requirements of State and Federal stormwater laws. DelDOT's ES_2M shall require 30 calendar days to review the plans and stormwater management report.

Plans for review shall be developed in half size (11"x17") and arranged similar to DelDOT plans for consistency and ease of review. Section 1 of ES_2M Design Guide contains a checklist which shall be completed and submitted with the plans along with a transmittal memo requesting the plans to be reviewed by DelDOT.

The stormwater management report shall be required in order to assess conformance with the provisions of DSSR. Section 2 of ES_2M Design Guide describes the content of organization of the report that shall be followed.

The following shall also apply to all site designs:

1. Stormwater facilities, excluding bioswales, shall be located a minimum of 20 feet from the State right-of-way.

2. Any stormwater management pond shall be designed so that the invert of all inlet pipes is above the normal pool elevation. Exceptions to this requirement will only be considered if requested in writing with supporting documentation. In no case shall the normal pool elevation exceed the invert of the nearest drainage inlet.

3. DelDOT shall not allow the outflow from stormwater management ponds to discharge into the State right-of-way if there is the ability to discharge the run-off to a different location.

4. Where the outfall for any stormwater management pond outlets onto the State right-of-way, a detailed hydraulic and stormwater analysis shall be required to determine the impacts to the roadway drainage system and to ensure stormwater impacts for surrounding property owners is minimized (see Section 5.7).

5. If there is an identified drainage problem and the proposed site will impact the problem

area, the applicant shall contribute towards mitigation through management of stormwater, wherever possible.

Figure 4.5 Sample Title Sheet